

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Appl. No.: 10/621,569

Atty. Docket No. Q76639

**AMENDMENTS TO THE SPECIFICATION**

**Please replace the present title with the following amended title:**

Process for producing biodiesel fuel using triglyceride-rich oleaginous seed directly in a transesterification reaction in the presence of an alkaline alkoxide catalyst~~Process for producing biodiesel.~~

**Please replace the paragraph starting at line 32 on page 5 of the specification with the following amended paragraph:**

~~Prior~~Previously to the process itself, the ~~eastern bean~~ oleaginous seed feed (11) is processed (12) with the aid of vibrating sieves provided with a hot air vent in order to withdraw foreign vegetable elements, and ~~dried~~ying until reaching a humidity content of less ~~lower~~ than 0.5% by weight.

**Please replace the paragraph starting at line 2 on page 6 of the specification with the following amended paragraph:**

Upon leaving the sieves, the seed feed (~~11~~) is directly fed to a reactor (~~14~~). Then anhydrous alcohol (10) from a storage tank (~~10~~) is poured on the seeds in the reactor. The heterogeneous feed ~~of in the reactor~~ (~~14~~) is then comminuted (14a) at ambient temperature. Catalyst (13) is then added to the reactor (~~14~~) without any heating, and then heating of the reaction mass is started in order to promote the transesterification reaction (14b) until a the 98 to 100% conversion of the triglycerides into fatty acid monoesters is attained.

**Please replace the paragraph starting at line 9 on page 6 of the specification with the following amended paragraph:**

Then the hot reaction mass is filtered (15) and the liquid phase (17) leaving the filter is pumped to a distiller for distillating (20) where alcohol ~~ethanol~~ (21) remaining in the liquid phase is distilled (~~21~~) under atmospheric pressure. After the end of the condensed alcohol collection, the distiller liquid is transferred to a decanting (23) tank (~~23~~) where it will stay for the required period of time to separate raw glycerin - lower phase - from ethyl esters - upper phase. After being collected, the raw glycerin phase (26) and the alkyl ester phase (27) are directed to distinct neutralization columns (30) and (31), one for each product, columns (30) and (31) being

filled with a slightly acidic ion exchange resin. The neutralized alkyl ester corresponds to biodiesel fuel. Typical analyses of the two kinds of biodiesel fuel products obtained in the experiments are listed in Table 2 below.

**Please replace the paragraph starting at line 19 on page 6 of the specification with the following amended paragraph:**

After being recovered from the filter press (15) linings, the solid phase (16) is dried (19) in a vacuum oven (49) at 45°C during ca. 16 h to recover the remaining ethanol (18) still retained in the mass. Then the obtained solid fraction (33), a dried flour, is may be sieved (22) in a set of vibrating sieves to separate the finest solids of granulometry of up to 20 mesh Tyler~~lower than 20 mm~~, that is the carbohydrate fraction (24). This fine fraction (24) will then be submitted to a hydrolysis and fermentation (28) process (28) so as to render possible that after the atmospheric distillation (32) of the remaining residue in the fermenting tank, ~~ethanol~~ alcohol (36) may be produced to make up the alcohol (10) feed to the transesterification reaction reactor (14b). This step is not required when the dried flour is directed to cattle feeding.

**Please replace the paragraph starting at line 29 on page 6 of the specification with the following amended paragraph:**

As for the coarser fraction (25) of the flour, chiefly made up of the seed hulls (25), such coarser fraction is milled (29) in a ball mill (29) until it reaches the approximate granulometry of up to 20 mesh Tyler. ~~It is then added of M~~ mineral supplements required for making up formulations (37) of fertilizers (37) suitable to be used in the oleaginous ~~eastor~~ bean culture itself may then be added.